

Mount Diablo Astronomical Society

Diablo Moon Watch

June 2014

GENERAL MEETING

Tuesday June 24, 2014

Supercomputing The Universe

by Dr. Joel Primack

**Doors open at 6:45 p.m.
Lindsay Wildlife Museum
1931 First Avenue,
Walnut Creek, CA 94597**

**Please park East of the
museum, follow the
instructions on the last page**

Computer simulations and theoretical understanding have now reached a stage where it is possible to compute the cosmic microwave background and the large scale distribution of galaxies with considerable precision,



and simulations are becoming increasingly able to tackle the complexity of galaxy formation and evolution.

This talk will describe in particular the Bolshoi simulations, which are currently the most accurate simulations of cos-

mological large scale structure, and compare their predictions with observations. The new Bolshoi-Planck simulation has the same high resolution as the original Bolshoi-WMAP simulation, but with the new Planck cosmological parameters. The talk will also review the successes and challenges of high-resolution hydrodynamic galaxy simulations; and it will describe

(Continued on page 3)

Space Weather Report for an Alien World. by The European Space Agency

For the first time, ESA is providing regular space-weather reports for a spacecraft orbiting another planet.

When your spacecraft is surfing deep into the atmosphere of an alien world, you need the latest

information on conditions that could affect your trajectory.

If that planet is Venus, that means knowing what's happening on our Sun in real time, because solar activity can greatly influence conditions like atmospheric density and the radiation environment at Earth's closest neighbour.

Since May, ground controllers flying Venus Express have been receiving daily reports on solar activity issued by experts at ESA's Space Weather Coordination Centre (SSCC), at the Space Pole in Belgium.

Surfing the Venus atmosphere

The centre was established by the Agency's Space Situational Awareness (SSA) programme office, and it began delivering precursor space-weather services for terrestrial clients in last year.

(Continued on page 4)

WHAT'S UP

Death Valley Days . . . and Nights!

by Marni Berendsen

Over the last several months, Marni spent ten weeks volunteering in Death Valley National Park doing astronomy programs.

What did she do?

What were the skies like? What are all the cool perks of volunteering? Find out in this month's What's Up.

PRESIDENT'S CORNER

This Month's Club News and Commentary

by Jim Head

Earthrise, the real story

Fellow member and dedicated outreach Tom Boltz found a great video on the story on how this famous image came about, includes the conversation of astronauts Frank Borman, Jim Lovell, and Bill Anders from inside of Apollo 8 as they were orbiting the moon.

<https://www.youtube.com/embed/dE-vOscpiNc>

The World's Largest Solar Astronomy Outreach Program

I met Stephen Ramsden of the Charlie Bates Solar Astronomy Project at the Starlight Festival in Big Bear (near RTMC) last month.



Stephen and his wife formed a non-profit to bring solar events to many locations in the US and around the world, to schedule his program all you need to do is to pay shipping for his customized Ford Transit Connect, loaded with 6 solar scopes and mounts, 3 monitors, pop-up shade canopies, props. . . He sets up a white-light, Calcium-K, and Ha for visual observing, and another set of 3 with cameras, each going to one of three displays in the shade. He has helped support programs in many countries, and was on his way to Australia after the stint at the Starlight Festival. He donated 200 solar viewing glasses for our outreach programs, thanks Stephen!

<http://solarastronomy.org/>

Upcoming events:

Mt. Diablo Docent Training, 6/14, you must complete this program if you wish to setup a telescope or activities on Mt. Diablo during one of our Public Nights. Get the details at

https://nightsky.jpl.nasa.gov/event-view.cfm?Event_ID=57761

Solar Activities at the Lindsay Wildlife Museum this Sunday. Come out and see what our Sun is doing, Live! Solar-filtered telescopes and related activities will be setup for the general public, including MDAS members, from 1-4 PM Sunday June 15th... the weather forecast suggests clear skies with a high of only 82!

https://nightsky.jpl.nasa.gov/event-view.cfm?Event_ID=56898

Next Public night is June 21, Saturn should be great, and the last of Jupiter for awhile. July's public night is earlier, on July 5th.

Hope to see you at GSSP!

Thank you for opening this issue of the Diablo MoonWatch, hope you enjoy it. . . send your stories!

Jim

Supercomputing The Universe *(Continued from page 1)*

the new Assembling Galaxies of Resolved Anatomy (AGORA) program to run such simulations using as much as possible the same initial conditions, physical assumptions, and output analysis procedures. AGORA will systematically compare a wide variety of computer codes with each other and with observations, and thus improve understanding of galaxy formation. Finally, the talk will discuss in the context of astrophysics the high-performance computation challenges of big data and increasingly inhomogeneous computer architectures.

Joel Primack is a Distinguished Professor of Physics at the University of California, Santa Cruz. He specializes in the formation and evolution of galax-

ies and the nature of the dark matter that makes up most of the mass in the universe. Primack is one of the principal originators and developers of the standard modern picture of the universe on the large scale. With support from NSF, NASA, and the Department of Energy, he is currently using supercomputers to simulate and visualize the evolution of the universe and the formation of galaxies, and comparing the predictions to the latest observational data. He is Director of the University of California systemwide High-Performance Astro-Computing Center.

Primack was made a Fellow of the American Physical Society (APS) in 1988 "for pioneering contributions to gauge theory and

cosmology." He was a founder of the APS Forum on Physics and Society, which he chaired 2005-2006. In 1995 Primack was made a Fellow of the American Association for the Advancement of Science (AAAS), "for pioneering efforts in the establishment of the AAAS Congressional Science Fellows Program and for dedication to expanding the use of science in policymaking throughout government." He has served on the Federation of American Scientists board, he was a founder of the Union of Concerned Scientists, he started the AAAS Program on Science and Human Rights, and he was chair of the AAAS committee on Science, Ethics, and Religion 2000-2002.

Golden State Star Party—June 25 through June 29

The Golden State Star Party will be here before you know it. There is less than a month to go until the event. If you haven't registered yet, go to the GSSP website at



www.goldenstatestarparty.org and sign up today! We'll see you June 25-29 at Frosty Acres Ranch for another fun and memorable GSSP experience !

Space Weather Report for an Alien World. *(Continued from page 1)*

Now that Venus Express has completed its eight-year scientific mission, the reports are especially important as the control team take the satellite through an extraordinary multi-week 'aerobraking' campaign.

"Aerobraking means lowering the spacecraft so that for part of each orbit it dips down very low and skims through the very uppermost reaches of the Venusian atmosphere," notes Adam Williams, Deputy Spacecraft Operations Manager.

Venus Express aerobraking

"We know that the current state of our Sun can affect Venus' atmosphere, which could in turn impact the planned orbit of Venus Express as it passes through the atmosphere." Adam says that the team do not expect to replan any of the aerobraking orbits based on 'typical' solar activity levels. "The space weather reports will, however, allow us to better understand anomalous behaviour that we may subsequently observe on the spacecraft.

"And in extreme cases, we would be more ready to react to a serious situation. For example, if our startrackers were to be overloaded by radiation."

Reporting on a complex environment

The weather updates will deliver the best information from a variety of sources - including ESA's Proba-2 and solar-orbiting ESA and NASA spacecraft - to the control team as rapidly as possible. "The aim is to report on current conditions and give a short-term forecast of solar activity and radiation conditions, tailored for Venus," says Juha-Pekka Luntama, responsible for space weather in

"Venus is currently 59° ahead of Earth on its orbit around the Sun, and we do not have a spacecraft between the Sun and Venus as we have for Earth.

"So, we need to adapt and extend space weather forecasts we regularly provide towards the direction of Venus."

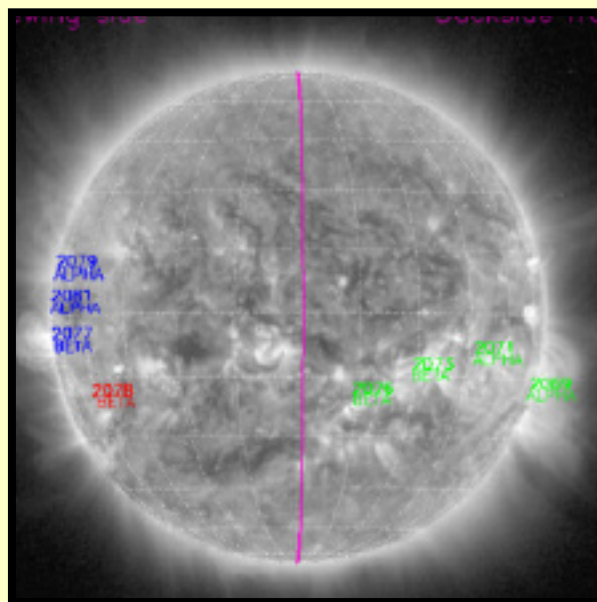
Federating European expertise

The first Venus space-weather report was issued on 19 May, and included analysis and forecasts based on data not only from the fleet of solar monitors but also from a new network of Expert Service Centres on the ground operated by ESA member states in the SSA programme.

Juha-Pekka says that ESA's network will be expanded later this year to include the Heliospheric Weather Expert Service Centre, which will provide dedicated space-weather information for missions travelling to other locations in the Solar System.

In the meantime, the SSCC will continue providing daily reports to the Venus Express team. "We'll also issue special bulletins during the day if there is a significant solar event that might affect the Venus space environment.

"If we've learned anything about forecasting space weather, it's that there can always be surprises we were not able to predict."



Solar corona as seen from Venus

the SSA programme office.

Space weather coordination centre

"We're used to doing this for Earth-orbiting spacecraft, but it's quite a challenge for Venus due to both its location and the complexity of that planet's environment.

Mount Diablo Astronomical Society Event Calendar—June 2014

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1	2	3	4	5	6 8:45 PM Walnut Acres Stargazing (Private)	7
8	9 7:30 PM Board Meeting (Private)	10	11	12	13	14 10:00 AM Decent Training Session
15 1:00 PM Solar at the LWM sunset: 19:12	16	17	18	19 7:00 PM MDAS Imaging Meeting (Private)	20	21 8:00 PM Public Astronomy: Aliens
22 sunset: 19:14	23	24 7:15 PM GenMtg: Cosmic supercompu	25 GSSP	26 GSSP	27 GSSP	28 GSSP 7:30 PM Society Observing (Private) 8:30 PM RHCC
29 GSSP sunset: 19:15	30					

Mount Diablo Astronomical Society Event Calendar—July 2014

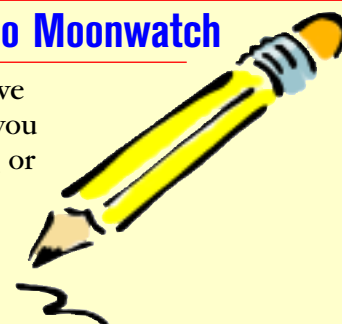
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1	2	3	4 	5 7:30 PM Public Astronomy-Sun/W
6 sunset: 19:13	7 7:30 PM Board Meeting (Private)	8	9	10	11 	12
13 sunset: 19:11	14	15	16	17 7:00 PM MDAS Imaging Meeting (Private)	18 	19 7:00 PM Observatory Maintenance (Private) 1:30 PM Hercules Library
20 sunset: 19:06	21	22 7:15 PM GenMtg: Exoplanets	23	24	25	26  7:30 PM Society Observing (Private)
27 sunset: 19:01	28	29	30 8:00 PM LWM Public Stargazing	31		

Share your news with other members through the Diablo Moonwatch

We are always looking for new articles, images or photos and content. If you have astronomical perspectives or experiences to share with your fellow members that you would us to consider, please feel free to contact me Jim (jamesnhead@comcast.net) or our newsletter editor Vianney. (veloroute@hotmail.com)

Clear skies!

Jim and Vianney



Board Members & Address

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General Meetings:

Fourth Tuesday every month,
except on the third Tuesday in
November and December.

Refreshments and conversations at 6:45 pm;
Meeting begins at 7:15

Where:

Lindsay Wildlife Museum

1931 1st Avenue

Walnut Creek, CA 94597

(925) 935-1978

wildlife-museum.org

Directions to facility:

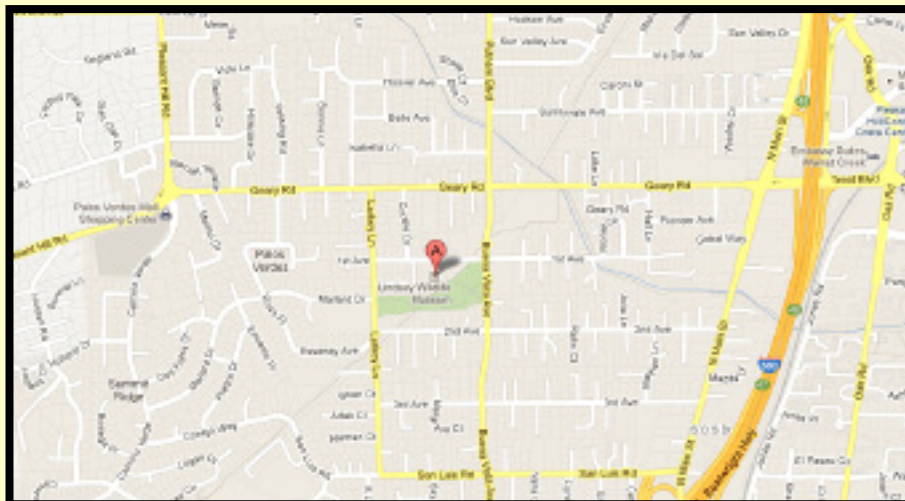
From the North: Take 680 South to Treat Blvd.
exit. Turn left at light onto North Main St. Turn
right on Geary Road. Turn left on Buena Vista.

Turn right on First Avenue. The museum is
halfway up the block on the left.

From the South: Take 680 North. Take the Treat
Blvd./Geary Road exit and turn left over free-
way. Go three more lights and turn left on
Buena Vista. Turn right on First Avenue. The
museum is halfway up the block on the left.

Parking:

The museum is located in a residential area.
There are no parking fees nor meters. Please
park only in the museum parking lots on the
east side of the museum, the Friends Church lot
across the street (except Sunday mornings) or
on Buena Vista Avenue. Please do not park on
First Avenue in front of our neighbors' homes
— you will get a parking ticket.



Messier 11 captured by Mike Lewis using TEC-140 on a CGE PRO mount

